

AMENDMENTS TO THE CLAIMS:

Please cancel claims 21, 29, and 31, without prejudice or disclaimer of the subject matter therein, amend claims 1, 5, 7-15, 19, 20, 22-28, 30, 32-34, and 40, and add new claims 41-54, as denoted in the following listing. This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A method of detecting contamination of engine fluid in an engine, comprising:
providing engine fluid to a particle counter; ~~and~~
measuring a characteristic of cleanliness of the engine fluid with the particle counter during operation of the engine; and
initiating operation of a filtration system coupled to the engine to clean the engine fluid when the characteristic of cleanliness measured with the particle counter exceeds a threshold value.
2. (Original) The method of claim 1, further including displaying the characteristic of cleanliness to an operator.
3. (Original) The method of claim 1, further including operating the engine in a dynamometer test during the stage of measuring the characteristic of cleanliness of the engine fluid.
4. (Original) The method of claim 3, further including halting the dynamometer test based on the characteristic of cleanliness of the engine fluid.

5. (Currently amended) The method of claim 1, wherein the characteristic of cleanliness is selected from one of a particle count, a particle size, and ~~or~~ a rate of particle accumulation.

6. (Original) The method of claim 1, wherein the engine fluid is unfiltered.

7. (Currently amended) The method of claim ~~2~~ 1, ~~further including placing a filtration system on the engine~~ wherein initiating operation of the filtration system includes initiating operation of the filtration system in response to a command received from the operator.

8. (Currently amended) The method of claim ~~1~~ 7, ~~further including operating the engine in a dynamometer test during the stage of measuring the characteristic of cleanliness of the engine fluid~~ wherein initiating operation of the filtration system includes initiating operation of the filtration system automatically in response to the characteristic of cleanliness exceeding the threshold value.

9. (Currently amended) The method of claim ~~1~~ 7, further including ~~operating the filtration system to clean~~ identifying a characteristic of a quality of build of the engine based on an analysis of the characteristic of the cleanliness of the engine fluid.

10. (Currently amended) The method of claim 9, further including displaying the characteristic of the quality of build to an engine builder ~~wherein the operation of the filtration system is triggered by the characteristic of cleanliness exceeding a threshold value.~~

11. (Currently amended) ~~A~~ The method of claim 1 detecting contamination of engine fluid in an engine, further comprising:
providing engine fluid to a particle counter;
measuring a characteristic of cleanliness of the engine fluid with the particle counter during operation of the engine; and
making recommendations to an engine builder based on an analysis of the characteristic of the cleanliness of the engine fluid.

12. (Currently amended) A system for measuring contamination in engine fluid of an engine, comprising:
a source of engine fluid;
a particle counter attached to the source of engine fluid from the engine for measuring a characteristic of cleanliness of the engine fluid; and
a drain for draining the engine fluid from the particle counter
a filtration system in fluid communication with the engine for filtering and returning engine fluid from the engine, wherein the filtration system is initiated when the characteristic of cleanliness measured by the particle counter exceeds a threshold value.

13. (Currently amended) The system of claim 12, ~~further including a filtration system in fluid communication with the engine for filtering and returning engine fluid from the engine~~ wherein the filtration system is initiated by an operator when the characteristic of cleanliness measured by the particle counter exceeds a threshold value.

14. (Currently amended) The system of claim ~~12~~ 13, wherein the filtration system is a kidney loop filtration system.

15. (Currently amended) The system of claim 12 ~~13~~, wherein the filtration system further includes:

an external pump for drawing the engine fluid from the engine; and
an external filter through which the pump draws the engine fluid.

16. (Original) The system of claim 12 wherein the particle counter is an optical type particle counter.

17. (Original) The system of claim 12, further including a computer for displaying particle count information, said computer being in communication with the particle counter.

18. (Original) A filtration system for cleaning engine fluid during an engine dynamometer test, comprising:

an external pump for drawing the engine fluid from the engine; and
an external filter through which the pump draws the engine fluid.

19. (Currently amended) The filtration system of claim 18, wherein the external filter is placed upstream of the external pump and removes particulate of a first size from the engine fluid.

20. (Currently amended) The filtration system of claim 19, further including a second external filter placed downstream of the external pump, the second external filter removing particulate of a second size, smaller than the first size, from the engine fluid.

21. (Canceled)

22. (Currently amended) A method of detecting contamination in engine fluid and cleaning engine fluid in a running engine, comprising:
measuring characteristics of the cleanliness of the engine fluid during a test cycle;
operating a filtration system for a first period of time in the test cycle; and
operating the filtration system ~~taking corrective action~~ during a second period of time in the test cycle when the characteristics of the cleanliness of the engine fluid reaches a threshold level.

23. (Currently amended) The method of claim 22, further comprising
~~wherein taking corrective action includes~~ halting the running of the engine when a malfunction criteria is met.

24. (Currently amended) The method of claim ~~23~~ 22, wherein the malfunction criteria includes a decrease in engine cleanliness over time ~~taking corrective action~~
~~includes operating the filtration system for the second period of time in the test cycle.~~

25. (Currently amended) The method of claim 22, wherein the characteristic of cleanliness is selected from one of a particle count, a particle size, and ~~or~~ a rate of particle accumulation.

26. (Currently amended) A system for detecting contaminants in engine fluid from a running engine ~~and cleaning the contaminants~~ during an engine dynamometer test, comprising:

a filtration system for cleaning the engine fluid, the filtration system having:

an external pump for drawing the engine fluid from the engine; and

an external filter through which the pump draws the engine fluid; and

a particle counter system ~~attached to a source of unfiltered engine fluid, the particle counter system~~ including an optical particle counter ~~and a computer for displaying particle count information, said computer being in communication with the particle counter~~

wherein information derived from the particle counter system is used to determine a characteristic of cleanliness of the engine fluid during operation of the engine at a plurality of engine loads during the dynamometer test.

27. (Currently amended) ~~A~~ In a system having a particle counter and a filtration system, a method of analyzing the health of an engine and cleaning engine fluid during operation of the engine, comprising:

providing engine fluid to a particle counter during a first time period; and

operating the particle counter to measure ~~measuring~~ a characteristic of ~~the~~ cleanliness of ~~the~~ engine fluid in the engine ~~with the particle counter~~ during ~~operation of the engine~~ the first time period; and

initiating operation of the filtration system during the first period if the characteristic of cleanliness measured by the particle counter exceeds a threshold value during the first time period.

28. (Currently amended) The method of claim 27, wherein the characteristic of the cleanliness of the engine fluid is selected from one of a particle count, a particle size, and ~~or~~ a rate of particle accumulation.

29. (Canceled)

30. (Currently amended) The method of claim ~~27~~ 29, further comprising analyzing the health of the engine based on the characteristic of cleanliness during ~~a~~ the first time period.

31. (Canceled)

32. (Currently amended) ~~A~~ The method of ~~claim 30~~ analyzing the health of an engine, further comprising:
providing engine fluid to a particle counter;
measuring a characteristic of the cleanliness of the engine fluid with the particle counter during operation of the engine;
analyzing the health of the engine based on the characteristic of cleanliness; and
making recommendations to a builder of the engine based on the health of the engine ~~during the first period.~~

33. (Currently amended) The method of claim ~~27~~ 29, further comprising:
providing engine fluid to a ~~the~~ particle counter during a second time period; and
measuring the characteristic of the cleanliness of the engine fluid with the particle counter during operation of the engine during a ~~the~~ second time period.

34. (Currently amended) The method of claim 33, further comprising filtering the engine fluid with the filtration system during the second time period to clean contaminants from the engine fluid.

35. (Original) The method of claim 34, wherein a duration of the second time period is based on a preset time value.

36. (Original) The method of claim 34, wherein a duration of the second time period is based on the characteristic of the cleanliness of the engine.

37. (Original) The method of claim 34, further comprising analyzing the health of the engine based on the characteristic of cleanliness during the second time period.

38. (Original) The method of claim 37, further comprising providing an indication of a malfunctioning engine if the characteristic of cleanliness is a particle count and if the particle count rises above a threshold value over a period of time.

39. (Original) The method of claim 37, further comprising halting the engine if the health of the engine indicates a malfunction.

40. (Currently amended) The method of claim ~~34~~ 27, further comprising ~~analyzing the health of the engine in response to the characteristic of the cleanliness of the engine~~ operating the particle counter without the filtration system during a third time period to monitor the health of the engine after the engine fluid has been cleaned during the second period of time.

41. (New) A method of detecting engine fluid contamination in an engine, comprising:

varying a load at which the engine is run;

providing engine fluid from the engine to a particle counter while varying the load; and

measuring a characteristic of cleanliness of the engine fluid with the particle counter.

42. (New) The method of claim 41, further comprising:

activating a filtration system for a latter portion of a first cycle in which the engine is run at low idle;

activating the filtration system during an initial portion of a second cycle in which the engine is run at an increased load;

activating the filtration system for a latter portion of a third cycle in which the engine is run at full speed; and

activating the filtration system during an initial portion of a fourth cycle in which the engine is run at low idle.

43. (New) The method of claim 41, wherein varying the load at which the engine is run includes varying the load during an engine dynamometer test.

44. (New) The method of claim 40, further comprising determining when a malfunction criteria is met.

45. (New) The method of claim 44, wherein the malfunction criteria includes a decrease in engine cleanliness over time.

46. (New) The method of claim 44, wherein the malfunction criteria includes a detection of large particles.

47. (New) The method of claim 44, wherein the malfunction criteria includes an increase in particles over time.

48. (New) The method of claim 44, further comprising halting operation of the engine when the malfunction criteria is met.

49. (New) The method of claim 1, further comprising determining when a malfunction criteria is met.

50. (New) The method of claim 49, wherein the malfunction criteria includes a decrease in engine cleanliness over time.

51. (New) The method of claim 49, wherein the malfunction criteria includes a rapid detection of large particles.

52. (New) The method of claim 49, further comprising taking corrective action when the malfunction criteria is met.

53. (New) The method of claim 52, wherein taking corrective action includes halting operation of the engine.

54. (New) The system of claim 26, wherein the filtration system operates during the dynamometer test based on the plurality of loads at which the engine is operated during the dynamometer test.